

CLAIMS

What is claimed is:

1 1. An apparatus for testing equipment located in a local environment by
2 presenting a detectable indicator gas therein, said apparatus comprising:
3 a container portion;
4 a chemical substance stored in said container portion;
5 a pump operable to draw air into said container and in contact with said chemical
6 substance to generate a detectable indicator gas, wherein said pump is integrally formed as
7 one piece with said container portion; and
8 an outlet to said container for directing said indicator gas into the local environment.

1 2. The testing apparatus of claim 1, wherein said pump is a manually squeezable
2 bulb.

1 3. The testing apparatus of claim 1, wherein said pump is selected from the group
2 of manually operable pumps consisting of: a manually squeezable bulb, a bellows-driven
3 pump, a syringe, and combinations thereof.

1 4. The testing apparatus of claim 1, wherein said pump is joined seamlessly with
2 said container portion.

1 5. The testing apparatus of claim 1, wherein said container portion and said
2 pump are formed from a plastic material.

1 6. The testing apparatus of claim 5, wherein said plastic material is low density
2 polyethylene.

1 7. The testing apparatus of claim 1, wherein said container portion is formed
2 from a first material and said pump is formed from a second material distinct from said first
3 material.

1 8. The testing apparatus of claim 1, wherein said container portion and said
2 pump are formed from a laminate of at least a first material layer and a second material layer
3 distinct from said first material layer.

1 9. The testing apparatus of claim 1, wherein said container portion and said
2 pump form a substantially permanent molded structure.

1 10. The testing apparatus of claim 1, wherein said chemical substance is reactive
2 with the container environment, upon operation of the pump, to generate said indicator gas.

1 11. The testing apparatus of claim 1, wherein said chemical substance is selected
2 such that said chemical substance and air drawn into said container portion generate a scented
3 indicator gas upon contact.

1 12. The testing apparatus of claim 1, wherein said chemical substance is reactive
2 with air to produce an irritant gas.

1 13. The testing apparatus of claim 12, wherein said chemical substance is liquid
2 SnCl_4 and said indicator gas is an acid vapor fume.

1 14. The testing apparatus of claim 1, wherein said chemical substance is reactive
2 with the container environment, upon operation of the pump, to generate a visually detectable
3 indicator gas.

1 15. The testing apparatus of claim 1, wherein said pump has a hole to allow finger
2 release of pressure.

1 16. The testing apparatus of claim 1, further comprising an exterior layer of
2 laminate that seals the container.

1 17. A method of manufacturing an apparatus for testing equipment in a local
2 environment by presenting a detectable indicator gas therein, said method comprising the
3 steps of:

4 *Sub 023* providing a flexible material;

5 integrally forming, as one piece, a container portion and a squeeze bulb portion using
6 the flexible material; and

7 storing a chemical substance in the container portion such that upon operation of the
8 bulb to draw air into the container portion, a detectable indicator gas is generated for
9 presentation into the local environment.

1 18. The method of claim 17, wherein the flexible material is plastic.

1 19. The method of claim 17, further comprising the step of sealing a breakable end
2 tip of the container tube portion located opposite the squeeze bulb.

1 20. The method of claim 17, wherein the step of storing includes storing a
2 chemical that, when contacted by air drawn into the container portion generates a visually
3 detectable indicator gas.

1 21. The method of claim 17, further comprising the steps of providing a second
2 material distinct from the plastic material, whereby said integrally forming step includes
3 forming said container portion and said pump from a laminate comprising said plastic
4 material and said second material.

1 22. A method of testing equipment in a local environment by presenting a
2 detectable indicator gas therein, said method comprising the steps of:

3 storing a chemical substance, reactive with air to produce an indicator gas, in a
4 container formed substantially from a polymeric material;

5 providing a polymeric squeeze bulb device in operative communication with the
6 container and formed integrally, as one piece, therewith;

7 breaking a portion of the container tube to provide an outlet;

8 operating the squeeze bulb to draw air past the chemical substance to produce a
9 human detectable indicator gas;

10 directing the indicator gas outward of the container and into the local environment;
11 and

12 detecting the indicator to determine the operability of the equipment in the local
13 environment.

1 23. The method of claim 22, wherein the indicator gas is a visually observable
2 gas, said detecting step including visually observing the behavior of the indicator gas in the
3 local environment.

1 24. The method of claim 23, wherein said observing step includes visually
2 observing the flow of the indicator gas in the local environment.

1 25. The method of claim 22, wherein the chemical substance is liquid SnCl_4 or
2 H_2SO_4 and said step of operating the squeeze bulb generates a chemical reaction producing
3 an irritant indicator gas.

26. The method of claim 22, wherein the indicator gas is indicator gas having a pre-selected scent, said observing step including detecting the scent of the indicator gas to determine the operability of the equipment.

27. A testing method of indicating air flow, said method comprising the steps of:

storing a chemical substance, reactive with air to produce an indicator gas, in a sealed container tube formed substantially from a polymeric material;

providing a polymeric squeeze bulb device in operative communication with the container tube and integrally formed seamlessly therewith;

breaking a portion of the container tube to provide an indicator gas exit;

operating the squeeze bulb to draw air past the chemical substance to generate a reaction producing a visually observable indicator gas;

directing the indicator gas outward of the container into the vicinity of the desired air-flow testing area; and

visually observing the indicator gas in the air-flow testing area.

1 28. An apparatus for fit testing a respiratory protection devices using a detectable
2 indicator gas placed in the vicinity of the respiratory protection device, said apparatus
3 comprising:

4 a container portion;

5 a chemical substance stored in said container portion; and

6 a squeeze bulb integrally formed as one-piece with said container portion, said
7 squeeze bulb being operable to draw air into the container portion to generate a reaction
8 between said chemical substance and the air, and to produce a detectable indicator gas.

1 29. The apparatus of claim 28, wherein said squeeze bulb and said container
2 portion are formed from a polymeric material.

1 30. The apparatus of claim 28, wherein said chemical substance is liquid SnCl_4
2 reactive with air to produce an irritant vapor fume.

1 31. The apparatus of claim 28, wherein said container portion and said squeeze
2 bulb form a molded seamless one-piece structure.